AN APPARATUS AND METHOD FOR MEASURING A PROPERTY OF A LAYER IN A MULTILAYERED STRUCTURE

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ABSTRACT

An apparatus measures a property of a layer (such as the sheet resistance of a conductive layer) by performing the following method: (1) focusing the heating beam on the heated a region (also called "heated region") of the conductive layer (2) modulating the power of the heating beam at a predetermined frequency that is selected to be sufficiently low to ensure that at any time the temperature of the optically absorbing layer is approximately equal to (e.g., within 90% of) a temperature of the optically absorbing layer when heated by an unmodulated beam, and (3) measuring the power of another beam that is (a) reflected by the heated region, and (b) modulated in phase with modulation of the heating beam. The measurement in act (3) can be used directly as a measure of the resistance (per unit area) of a conductive pad formed by patterning the conductive layer. Acts (1)-(3) can be repeated during fabrication of a semiconductor wafer, at each of a number of regions on a conductive layer, and any change in measurement indicates a corresponding change in resistance of the layer. When the measurement changes by more than a predetermined amount (e.g., by 10%), a process parameter that controls the fabrication process is changed to return the measurement to normal in the next wafer.